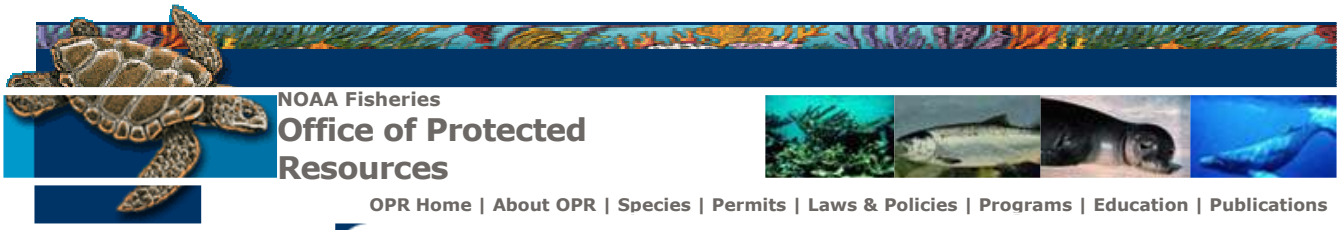

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Sperm Whales *(Physeter macrocephalus)*

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Status

ESA Endangered - throughout its range
ESA Candidate Species - Gulf of Mexico "Distinct Population Segment"
MMPA Depleted - throughout its range
CITES Appendix II - throughout its range

Sperm Whale (click for high-resolution)
(Physeter macrocephalus)
Photo: Tim Cole, NMFS

Taxonomy

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Cetacea
Family: Physeteridae
Genus: *Physeter*
Species: *macrocephalus*

Species Description

Weight: females: up to 15 tons (13,607 kg)
males: up to 45 tons (40,823 kg)

Length: females: about 36 feet (11 m)
males: about 52 feet (16 m)

Appearance: mostly dark gray, though some whales have white patches on the belly, with an extremely large head that takes up about 1/3 of its total body length

Lifespan: unknown, but females mature around 30 years old and males mature about 50 years old

Diet: large squid, sharks, skates, and fishes

Behavior: they dive to feed and the average dive lasts about 35 minutes to depths of 1,312 feet (400 m), however dives may last over an hour and reach depths over 3,280 feet (1,000 m)

Did You Know?

- Sperm whales can be found from the equator to the edge of pack ice in both hemispheres.
- Sperm whales can dive for over an hour, to depths over 3,280 ft (1000 m).

Sperm whales (*Physeter macrocephalus*) are the largest of the odontocetes (toothed whales) and the most sexually dimorphic cetaceans, with males considerably larger than females. Adult females may grow to lengths of 36 feet (11 m) and weigh 15 tons (13,607 kg). Adult males, however, reach about 52 feet (16 m) and may weigh as much as 45 tons (40,823 kg).

The sperm whale is distinguished by its extremely large head, which takes up to 25 to 35% of its total body length. It is the only living cetacean that has a single blowhole asymmetrically situated on the left side of the head near the tip. Sperm whales have the largest brain of any animal (on average 17 pounds (7.8 kg) in mature males), however, compared to their large body size, the brain is not exceptional in size.

There are between 20-26 large conical teeth in each side of the lower jaw. The teeth in the upper jaw rarely erupt and are often considered to be vestigial. It appears that teeth may not be necessary for feeding, since they do not break through the gums until puberty, if at all, and healthy sperm whales have been caught that have no teeth.

Sperm whales are mostly dark gray, but oftentimes the interior of the mouth is bright white, and some whales have white patches on the belly. Their flippers are paddle-shaped and small compared to the size of the body, and their flukes are very triangular in shape. They have small dorsal fins that are low, thick, and usually rounded.

Because sperm whales spend most of their time in deep waters, their diet consists of many larger organisms that also occupy deep waters of the ocean. Their principle prey are large squid weighing between 3.5 ounces and 22 pounds (0.1 kg and 10 kg), but they will also eat large demersal and mesopelagic sharks, skates, and fishes. The average dive lasts about 35 minutes and is usually down 1,312 feet (400 m), however dives may last over an hour and reach depths over 3,280 feet (1,000 m).

Sperm Whale
(Physeter macrocephalus)
Photo: NMFS Northeast Fisheries Science Center

Female sperm whales reach sexual maturity around 9 years of age when they are roughly 29 feet (9 m) long. At this point, growth slows and they produce a calf approximately once every five years. After a 14-16 month gestation period, a single calf about 13 feet (4 m) long is born. Although calves will eat solid food before one year of age, they continue to suckle for several years. Females are physically mature around 30 years and 35 feet (10.6 m) long, at which time they stop growing. For about the first 10 years of life, males are only slightly larger than females, but males continue to exhibit substantial growth until they are well into their 30s. Males reach physical maturity around 50 years and when they are 52 feet (16 m) long. Unlike females, puberty in males is prolonged, and may last between ages 10 to 20 years old. Even though males are sexually mature at this time, they often do not actively participate in breeding until their late twenties.

Most females will form lasting bonds with other females of their family, and on average 12 females and their young will form a family unit. While females generally stay with the same unit all their lives in and around tropical waters, young males will leave when they are between 4 and 21 years old and can be found in "bachelor schools", comprising of other males that are about the same age and size. As males get older and larger, they begin to migrate to higher latitudes (toward the poles) and slowly bachelor schools become smaller, until the largest males end up alone. Large, sexually mature males that are in their late 20s or older, will occasionally return to the tropical breeding areas to mate.

Habitat

Sperm whales tend to inhabit areas with a water depth of 1968 feet (600 m) or more, and are uncommon in waters less than 984 feet (300 m) deep. Female sperm whales are generally found in deep waters (at least 3280 feet, or 1000 m) of low latitudes (less than 40°, except in the North Pacific where they are found as high as 50°). These conditions generally correspond to sea surface temperatures greater than 15°C, and while female sperm whales are sometimes seen near oceanic islands, they are typically far from land.

Immature males will stay with female sperm whales in tropical and subtropical waters until they begin to slowly migrate towards the poles, anywhere between ages 4 and 21 years old. Older, larger males are generally found near the edge of pack ice in both hemispheres. On occasion, however, these males will return to the warm water breeding area.

No critical habitat has been designated for this species.

Distribution

Sperm Whale Range Map
(click for larger view PDF)

Sperm whales inhabit all oceans of the world. They can be seen close to the edge of pack ice in both hemispheres and are also common along the equator, especially in the Pacific. Sperm whales are found throughout the world's oceans in deep waters between about 60° N and 60° S latitudes. Their distribution is dependent on their food source and suitable conditions for breeding, and varies with the sex and age composition of the group. Sperm whale migrations are not as predictable or well understood as migrations of most baleen whales. In some mid-latitudes, there seems to be a general trend to migrate north and south depending on the seasons (whales move poleward in the summer). However, in tropical and temperate areas, there appears to be no obvious seasonal migration.

For management purposes, sperm whales inhabiting U.S. waters have been divided into five stocks:

California-Oregon-Washington Stock Sperm whales are found year-round in California waters, but they reach peak abundance from April through mid-June and from the end of August through mid-November. They were seen in every season except winter (Dec-Feb) in Washington and Oregon.

North Pacific (Alaska) Stock The shallow continental shelf apparently bars the movement of sperm whales into the northeastern Bering Sea and Arctic Ocean. Males are thought to move north in the summer to feed in the Gulf of Alaska, Bering Sea, and waters around the Aleutian Islands.

Hawaiian Stock Summer/fall surveys in the eastern tropical Pacific show that although sperm whales are widely distributed in the tropics, their relative abundance tapers off markedly westward towards the middle of the tropical Pacific and tapers off northward towards the tip of Baja California.

Northern Gulf of Mexico Stock Seasonal aerial surveys confirm that sperm whales are present in the northern Gulf of Mexico in all seasons, but sightings are more common during the summer.

North Atlantic Stock In winter, sperm whales are concentrated east and northeast of Cape Hatteras. In spring, the center of distribution shifts northward to east of Delaware and Virginia, and is widespread throughout the central portion of the mid-Atlantic bight and the southern portion of Georges Bank. In summer, the distribution is similar but also includes the areas east and north of Georges Bank and into the Northeast Channel region, as well as the continental shelf (inshore of the 100 m isobath) south of New England. In the fall, sperm whale occurrence south of New England on the continental shelf if at its highest levels, and there remains a continental shelf edge occurrence in the mid-Atlantic bight.

Population Trends

During the past 2 centuries, commercial whalers took about 1,000,000 sperm whales. Despite this high level of "take", the sperm whale remains the most abundant of the large whale species. Currently, there is no good estimate for the total number of sperm whales worldwide. The best estimate, that there are between 200,000 and 1,500,000 sperm whales, is based on extrapolations from only a few areas that have useful estimates.

For management purposes, sperm whales inhabiting U.S. waters have been divided into five stocks. The most recent stock assessment reports with population estimates are available on our website.

Threats

Historically:

- whaling (mainly 1800-1987) took at least 436,000 sperm whales, but possibly as many as 1,000,000. Hunting of sperm whales by commercial whalers declined in the 1970s and 1980s, and virtually ceased with the implementation of a moratorium against whaling by the IWC in 1988.

Currently:

- ship strikes
- entanglements in fishing gear, although these are not as great of a threat to sperm whales as they are to more coastal cetaceans
- disturbance by anthropogenic noise, notably in areas of oil and gas activities or where shipping activity is high
- accumulation of stable pollutants (e.g. polychlorobiphenyls (PCBs), chlorinated pesticides (DDT, DDE, etc.), polycyclic aromatic hydrocarbons (PAHs), and heavy metals). The potential impact of coastal pollution may be an issue for this species in portions of its habitat, though little is known.

Natural threats to sperm whales include killer whales, which have been documented killing at least one sperm whale in California. Typically, however, it is believed that most killer whale attacks are unsuccessful. Pilot whales have been observed harassing sperm whales, but it is unclear if they pose any real threat. Large sharks may also be a threat, especially for young sperm whales.

Conservation Efforts

The principal cause of the decline in sperm whales was commercial whaling, and prohibitions on their harvest by the IWC have reduced the magnitude of the threat. No activities in waters under U.S. jurisdiction are known to be adversely affecting recovery of this species at the present time. Therefore, management activities in the U.S. portion of its range are not likely to contribute substantially to recovery.

Regulatory Overview

The sperm whale was listed as endangered throughout its range on June 2, 1970 under the Endangered Species Conservation Act of 1969 (35 FR 8495) and is also protected under the Marine Mammal Protection Act of 1972.

Key Documents

(All documents are in PDF format.)

Title	*Federal Register*	Date
Positive 90-day Finding on a Petition to List Sperm Whales in the Gulf of Mexico as a Distinct Population Segment and to Designate Critical Habitat ■ Petition to List Gulf of Mexico DPS	78 FR 19176	03/29/2013
Final Recovery Plan	75 FR 81584	12/28/2010
5-Year Status Review	n/a	01/2009
5-Year Status Review Initiated	72 FR 2649	01/22/2007
ESA Listing Rule	35 FR 18319	12/02/1970
Stock Assessment Reports	n/a	various

More Information

- *Kids' Times*: Sperm Whale [pdf]
- NMFS National Marine Mammal Laboratory Sperm Whale Information
- NMFS Southwest Fisheries Science Center Sperm Whale Information
- Listen to Sperm Whale Sounds
- U.S. Fish & Wildlife Service Sperm Whale Species Profile

References

- Perrin, WF, Wursig, B, Thewissen JGM, eds. 2002. Encyclopedia of Marine Mammals. Academic Press.

Updated: May 10, 2013